

Worksheet 13

Due: Thursday, December 4

1. Solve $y'' + 5y' + 6y = 0$.
2. Solve $y'' + 5y' + 6y = 3$.
3. Solve $y'' + 5y' + 6y = x$.
4. Solve $y'' + 5y' + 6y = 2x - 9$. (Hint: use linearity of the differential operator.)
5. (a) Show that $Dx = 1 + xD$ by applying both sides to an unknown function f .
(b) Show that $D^2 - x^2 \neq (D + x)(D - x)$ by computing the composition. (This shows that “factoring the differential operator” is *much* harder when the differential operator has nonconstant coefficients.)